

CHAPIN (H.D.)

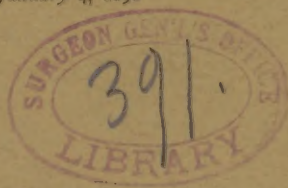
The Auriculo-Ventricular (Presystolic)
Sound. Some Considerations
on Cardiac Disease in
Early Life

BY

HENRY DWIGHT CHAPIN, A.M., M.D.

PROFESSOR OF DISEASES OF CHILDREN AT THE NEW YORK POST-GRADUATE
MEDICAL SCHOOL AND HOSPITAL, AND AT THE WOMAN'S MEDICAL
COLLEGE OF THE NEW YORK INFIRMARY; ATTENDING
PHYSICIAN TO THE DEMILT DISPENSARY

Reprinted from THE MEDICAL RECORD, January 4, 1890



NEW YORK
TROW'S PRINTING AND BOOKBINDING CO.
201-213 EAST TWELFTH STREET
1890

The Auriculo-Ventricular (Presystolic) Sound. Some Considerations on Cardiac Disease in Early Life

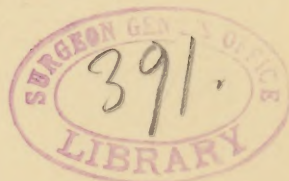
BY

HENRY DWIGHT CHAPIN, A.M., M.D.

PROFESSOR OF DISEASES OF CHILDREN AT THE NEW YORK POST-GRADUATE
MEDICAL SCHOOL AND HOSPITAL, AND AT THE WOMAN'S MEDICAL
COLLEGE OF THE NEW YORK INFIRMARY; ATTENDING
PHYSICIAN TO THE DEMILT DISPENSARY

Reprinted from THE MEDICAL RECORD, January 4, 1890

NEW YORK
TROW'S PRINTING AND BOOKBINDING CO.
201-213 EAST TWELFTH STREET
1890



THE AURICULO-VENTRICULAR (PRESYSTOLIC) SOUND. SOME CONSIDERATIONS ON CARDIAC DISEASE IN EARLY LIFE.¹

I. THE AURICULO-VENTRICULAR (PRESYSTOLIC) SOUND.—The presystolic, auriculo-systolic, or auriculo-ventricular murmur has been a subject of much discussion and acrid controversy. Gendrin in 1841 called attention to a presystolic murmur, and Fauvel in 1843 considered it to be due to mitral obstruction. This view seems to have been accepted at the time, but some years later Dr. Barclay advanced the idea that a mitral obstructive murmur had no existence in fact, the sound usually attributed to this condition being really due to regurgitation. This dispute has recently been renewed in the columns of *The Lancet* (1887) by Dr. Dickinson, who denies that the so-called presystolic murmur is indicative of mitral stenosis. He regards the murmur as covering the first portion of the systole up to the point of closure of the valve, and names it rather an early systolic murmur. Gairdner, Balfour, Bristowe, and others have vigorously replied. Dr. Bristowe has summed up the arguments in favor of the presystolic nature of the murmur as follows: (1) It accords with the physiological fact of the auricular contraction running into the ventricular systole, the beginning of which is indicated by the very sound that terminates the murmur; (2) the murmur precedes the pulse, and ends with the apex-beat; (3) the presystolic murmur does not

¹ Read before the Section on Practice of Medicine, New York Academy of Medicine, November, 1889.

differ in quality from the earlier mitral murmurs which are acknowledged to be direct ; (4) all the direct mitral murmurs are characterized by consonantal noisiness and lack of penetrating power, and are audible over a curiously restricted area, but are not conveyed into the axilla, as all regurgitant murmurs are. Finally, post-mortem examination not infrequently reveals a condition of stenosis of the mitral valve. The conclusions of this paper are derived from clinical studies alone, and hence must be taken for what they are worth. A presystolic or auriculo-ventricular sound is produced by some interference with the normal and easy passage of blood through the auriculo-ventricular septum or valve. The murmur is rough in quality, beginning at the end of diastole and ending abruptly with the systole. In rhythm, it may hence be considered post-diastolic as well as presystolic. One of the most characteristic points about this murmur is its abrupt termination. This quick stop of the abnormal bruit is very different from the gradual ending of mitral regurgitation. All the authorities I have been able to consult consider that the presystolic murmur is invariably due to organic disease at the mitral valve. There is a class of cases, however, in which this sound is distinctly heard, that I believe are entirely free from organic heart disease. Reference is here made to growing children, especially girls, who are pale and hydræmic, and suffer from various digestive disturbances. These cases are not only subject to palpitation of the heart, but, at times, especially after exercise, a more or less rough presystolic murmur may be heard at the apex. Many of these children have been confined for a long time in crowded or badly ventilated school-rooms. Possibly they are over-ambitious in their studies, but, at any rate, are in a condition of defective nervous equilibrium. Under treatment by iron, cod-liver oil, nutritious and easily digested food, with plenty of fresh air, the abnormal heart-sound will often disappear. It has seemed to me that the trouble in these cases is due to an irregular muscular action, de-

pendent upon a defective innervation of the heart. Weak children have an especial tendency to a faulty, over-irritable action of the muscles, both voluntary and involuntary. This may be shown only by incontinence of urine, or by twitching of certain muscles of the face, or it may eventuate in general chorea. Why may not the innervation of the heart be affected, with or without any of the disturbances just mentioned? In such a case an irritable, strongly acting auricle, with a mitral valve whose muscular fasciculi are too tense, might be a cause of a blubbering sound just before the systole. The sound produced by any such irregular muscular action would be intensified by the watery condition of the blood.

Undoubtedly a large proportion of cases of the pre-systolic murmur are due to organic valvular trouble. I have histories of forty cases, that I have been able to keep under observation for different intervals of time, varying from a few weeks to several years. The longest case has been eight years, during which time not a single cardiac symptom has been manifested. My youngest case was two years; next, 1 at seven, 4 at eight, 4 at nine, 2 at ten, 5 at eleven, 4 at twelve, 4 at thirteen, 6 at fourteen, 2 at fifteen, 2 at sixteen years, and 5 at later periods of life. I believe this murmur is exceedingly frequent in early life. My observation is based upon a much larger number of cases than those just quoted, which, of course, are too few for generalization. Meigs and Pepper state that mitral obstruction is comparatively frequent in childhood. Goodheart considers that in very young children this lesion is almost unknown, but begins to be noted in children of eight or nine years, and after this becomes common as years advance, until, finally, it is one of the commonest affections of adult life. Eustace Smith, on the contrary, considers that stenosis of the mitral orifice, unaccompanied by insufficiency of the valve, is not common in the child.

In 31 of my cases there was simple mitral obstruction, while in 9 cases there were combined murmurs. Of the

latter, 5 were double mitral, 3 were double aortic and double mitral, and 1 was a combined mitral and pulmonic obstructive murmur. The negative symptoms so frequently accompanying slight degrees of mitral obstruction doubtless lead many physicians to occasionally overlook the murmur. The commonest symptoms that I have noted are varying degrees of pain, and dyspnœa on exertion. The pain is usually referred directly to the region of the heart. In 16 of the cases of simple mitral obstruction pain was an important symptom. Upon running upstairs, or any similar violent exercise that caused a rapid action of the heart, this pain would ensue with more or less severity. It seemed as if the laboring of the heart to pass the blood quickly through the partially constricted auriculo-ventricular septum must produce a neuralgia in some of the adjacent nerves. Dyspnœa was very rarely severe, but in a large proportion of cases it was noticeable upon exertion, both by patient and family. A slight, dry cough was more or less frequent, and bronchitis was readily contracted and not very amenable to treatment. In the absence of marked symptoms, referable directly to the circulatory and respiratory organs, we must frequently look rather to the general condition of the child to observe the effects of mitral obstruction. An imperfect nutrition and absence of vigorous growth may not infrequently be the sole apparent result of imperfect cardiac function in early life. Most of my cases showed a lack of vigorous vitality, and a poor nutrition. I believe a careful examination of the heart will explain a certain proportion of cases of obscure developmental trouble and poor vitality in children, that cannot otherwise be accounted for.

The connection of this murmur with rheumatism is an interesting subject for consideration. Out of 31 cases of mitral obstruction, 20 presented evidences of rheumatic taint, as follows: In 6 cases there was a history of rheumatism in the immediate family, but none in the patient; in 4 cases there was rheumatism in the family,

and the child had likewise been attacked, while 10 cases gave a history of rheumatism only in the patient examined. Of the combined murmurs, 3 had had rheumatism, and 1 chorea but no rheumatism. It is now well known that the symptoms of rheumatism in early life are milder and in every way less pronounced than in the same affection of later years. There is frequently no appreciable redness or swelling of any joint. Rheumatic pains, however, go from one joint to another, or from one set of muscles to another, existing independently of any such factors as injury or over-exercise, which must be eliminated before making a diagnosis. In using all the care possible, there will be a certain class of cases in which it is exceedingly difficult to say whether obscure wandering pains are rheumatic or not. A careful examination of the heart may sometimes convince us that some uncertain pains have really been due to a rheumatic taint. Most of my cases of mitral obstruction have been preceded by a rheumatic manifestation that has been mild even for children. In this respect I can confirm the observation of Sansom that mitral stenosis is not independent of rheumatism, but is associated with the less pronounced forms of it—with its insidious, and not, so to speak, with its explosive varieties. He quotes the records of the London Hospital for 1880, which showed, while only fifty-eight per cent. of the cases of mitral stenosis presented a history of rheumatism, that seventy-seven per cent. of the cases of mitral regurgitation were rheumatic. The same author considers that an endocarditis, sometimes accompanying a rheumatism without pronounced phenomena, may be manifested by no subjective symptom, and yet differ in no essential feature from that which occurs in obvious relation with rheumatism. "The endocarditis which results in mitral regurgitation is more violent, so to speak, whilst that which initiates stenosis is more protracted, giving rise to a slower formation of fibrous, quasi-cicatricial tissue that under the even pressure of blood in the auricle tends to form the smooth septum which has

erroneously suggested a possible congenital causation." In 1886 I read before this Academy the conclusions based upon a study of 76 cases of rheumatism in children, of which 26 had valvular disease of the heart. Of these 26 cases, 18 had mitral regurgitant murmurs, while only 4 presented evidences of mitral obstruction, combined in 3 cases with other murmurs. These murmurs, however, were only considered in reference to cases in which the history of rheumatism was undoubted, being tabulated in connection with studies in rheumatism. I find, on the contrary, that when studying 31 cases of uncombined mitral stenosis, in 17 cases the vague pains were sufficiently repeated and suspicious to warrant my ascribing them to a rheumatic taint. Sajous (1888) quotes the opinion of Duroziez, Landouzy, and Schnell in favor of the frequent idiopathic origin of mitral stenosis, and, when pure and simple, it is found almost exclusively in women and children. In two cases, I have thought the presystolic murmur could be explained by aortic regurgitation, the mitral curtains being floated out by the return current and hence producing an obstruction to the mitral direct current, as explained by Flint. Goodheart advances an idea which, while difficult to prove, appears somewhat plausible. He queries whether the mitral regurgitation of infancy and early childhood, when recognized and carefully tended, may not in time eventuate in mitral stenosis. The mitral inflammation, which at its outset produced incompetence, by contraction and cicatrization may culminate in a final contraction of the orifice.

In making a diagnosis of the mitral direct murmur, it is well to remember that it varies according to the action of the heart. Walshe states that he has known the murmur to come and go from day to day, probably from a varying force of the heart's action, in a case where the mitral orifice was very greatly contracted and rigid. Sansom says most observers will agree that in some cases the presystolic murmur is extremely variable; it may be in-

audible during repose, and yet very evident when the patient is made to manifest some slight exertion. It is my custom to have the patient jump up and down in a vigorous manner before auscultation in any suspected case. Two of my patients with undoubted mitral stenosis have been accepted as first-class risks by insurance examiners, who, I think, would have given a different report had they taken this precaution. When the heart is acting quietly, not only may this murmur be indistinct, but the accentuation of the pulmonic second sound is not so noticeable. In some cases, by gently pressing the hand over the heart, a rolling, vermicular action is noticed, due to the slight delay and resistance to the passage of blood from auricle to ventricle. The well-known "purring thrill" can usually be distinctly noted. The existence of præcordial pain and dyspnoea on exertion will afford corroborative aids to diagnosis.

If we regard the prognosis of mitral stenosis from a theoretical stand-point, it will not be good, owing to the comparatively limited compensation that is possible. As a matter of fact, however, I believe the prognosis to be favorable. A large proportion of the cases will present very few grave symptoms, and some none at all. A very loud presystolic murmur exists in a young man, twenty-five years of age, whom I have watched for the past eight years. During this time he has not had a symptom that would appear to be referable to this lesion, although he plays tennis and engages in other active sports. I believe this form of valvular trouble is most apt to be overlooked; doubtless many persons who are not suspected of cardiac disease have some degree of mitral stenosis. The only instances of death I have known have had regurgitation combined with the stenosis, but most of my cases have been in early life, when death from any form of cardiac disease is not common. One boy, seven years of age, with marked cyanosis from birth, bulbous fingers, intense dyspnoea, pain over the heart, expectoration of blood, and blue mucous membranes, was evidently suffering from a

congenital lesion of the heart, the only physical sign of which was a mitral obstructive murmur. Such cases are rare, and the prognosis is, of course, very bad. If we can follow a case of mitral stenosis for a reasonable length of time and observe that the action of the heart is not embarrassed, and the patient suffers from little or no inconvenience, I believe the prognosis to be exceedingly good, even although the murmur persists. Treatment of any kind may be unnecessary. The use of general hygienic measures, with an occasional tonic, will sometimes be required. Some oversight should be kept over these cases and the indications met as they arise, just as in any other form of cardiac trouble.

II. SOME CONSIDERATIONS ON CARDIAC DISEASE IN EARLY LIFE.—It is frequently the experience of physicians to be called upon to treat cases of valvular disease of the heart, when it is impossible to trace back to the inception of the disease. The patient may not be able to give a history either of rheumatism or endocarditis, and seeks advice for dyspnoea, swelling of the extremities, or other symptoms of failing circulation. I believe a large proportion of the cases of valvular disease in the adult have begun in childhood. The first beginning of the trouble, which is the period for hopeful treatment, is not recognized. The nature of the rheumatism that attacks children is often obscure, and several attacks of wandering or so-called "growing pains" may be overlooked. While the heart may be the first structure attacked by rheumatism, this is not the common order of events. In most of the histories of valvular disease in children that I have taken, the cardiac affection seemed to come on after several attacks of rheumatism. Great care should be exercised to make an early diagnosis, and vigorous measures be taken to combat the first manifestations of rheumatism in children, fearful that, although the heart may escape the first mild attacks, it may suddenly and unexpectedly become affected by an equally light manifestation of the disease. When endocarditis ensues, the symptoms are apt to be

very obscure. Palpitation, slight pain, and breathlessness, with a dry cough, may not be particularly noticed by parents, although the child seems sicker than before. These cases are brought to the dispensaries, and the mother is quite surprised to learn that her child has beginning heart disease. Just at this juncture rest is indicated above all things. If this is not procured, the delicate, softened heart-muscle quickly undergoes dilatation, followed by permanent damage to the valves. Dilatation very readily takes place in the young subject. Compensation, however, quickly and completely ensues from hypertrophy, and there may be no sign, until years later, that great damage has been effected. But can no effort be made to avoid permanent lesion? By recognizing the endocarditis at the start, and keeping the child quiet, in bed if possible, we may seek to avoid dilatation and consecutive crippling of the valves. I have recently had a case under observation showing how this may sometimes be accomplished. A child, three years of age, was sent to the Babies' Ward, complaining of pains in his knees and ankles, with a slight cough, much dyspnœa, and distressed look in his countenance. He breathed with a good deal of distress, and auscultation revealed a loud systolic bruit. There was some swelling of the joints, but the rheumatism yielded to treatment, leaving a mitral systolic murmur, heard at the apex and transmitted around to the angle of the scapula.

Great effort was made to keep the child quiet, with every facility in the way of nurses, amusement, and good discipline. He spent most of his time semi-reclining in a steamer-chair. At the end of a month the murmur was distinct but not so loud, and when two months had elapsed it had entirely disappeared. If it is true that endocarditis will not always nor necessarily eventuate in valvular disease, it is certainly a clear indication to do all in our power to avoid dilatation, and hence increase the chances of such a desirable result. After the immediate symptoms of endocarditis have passed, children are too

often allowed to play about and take part in all kinds of vigorous exercises, as if nothing amiss had happened.

The perfect compensation usually occurring in childhood prevents many of the symptoms of circulatory disturbance seen in later life. Their vascular system is likewise healthy and elastic, which facilitates the work of the heart. As patients grow older, vascular changes ensue, which increase the strain upon a heart already crippled. I watched a boy for five years, having a double aortic and double mitral murmur, with great hypertrophy, who never appeared in the least incommoded by these grave lesions. He died from drowning while trying to swim against a swift current. In many of these cases, however, there is a faulty nutrition with more or less profound anæmia. The patients must be kept under observation, and the blood maintained in a good condition by a generous diet, iron, and cod-liver oil. We may hope in some cases, where the lesion is not extensive, that with an improved condition of the blood and healthy growth the heart may recover itself. Eustace Smith states that heart murmurs in children not uncommonly disappear; not only recent, soft murmurs, such as are heard in cases of chorea or acute rheumatism, but also louder and harsher murmurs, which are known to be of longer duration. If there is no hypertrophy of the left ventricle, it is not probable that any serious valvular defect is present.

